CHM 235: Organic Chemistry I

Part one of a two-semester science majors level course on the facts and principles of chemistry as they apply to carbon-based compounds. The course has a mandatory lab that complements the lecture. Topics include re-emphasis of lab safety, mixture separation techniques; spectroscopy; Lewis, Valence and Molecular orbital bonding theory; representing organic compounds; acid-based theory; relationship between structure and properties including polarity, stability, acidity and physical properties; stereochemistry; nomenclature; patterns in the physical and chemical properties of aliphatic cyclic and acyclic alkanes, alkenes, alkyl halides and alcohols; applying the principles of thermodynamics, kinetics and mechanism to substitution, addition, redox and elimination reactions. Prerequisite: CHM 114 with a grade of C or better. Three lecture hours and three laboratory hours per week. Instructional Support Fee applies.

Course Student Learning Outcomes

1. Apply the basic principles that govern covalent bonding concepts to the structure of organic compounds including the octet rule, Lewis structures, formal charge, hybridization and resonance.
2. Recognize families of organic compounds based on their functional groups, and apply nomenclature rules to draw formulas, structures, and write names or organic compounds.
3. Explain the role of chemical structure, hybridization, resonance and inductive effects on acid/base strength, and apply acid/base theory to correlate structure and reactivity in the context of the reactions and mechanisms or organic compounds.
4. Use molecular and/or computational models, structural drawings, and proper terminology to describe the conformations of alkanes and cycloalkanes, to distinguish stable versus reactive molecular conformations, and to explain chemical reactivity.
5. Apply the concepts of isomerism and chirality in organic chemistry, draw Fischer projections, recognize and assessing configurations.
6. Apply the knowledge of functional group reactivity to propose reasonable mechanisms to predict and explain the outcome of a reaction, relative reactivity and stereochemistry.

Credits: 4
Program: Chemistry